

University of Bahrain
College of Information Technology
Department of Computer Science
ITCS341: Object-Oriented Systems
2nd Semester, 2014/2015
First Test

Date: 18th March 2015

Time: 11:00-12:00

Student ID:	
Student Name:	
Section #	
Instructions for students	
<ol style="list-style-type: none">1. Ensure that you have <u>seven pages and five main questions</u> in the paper.2. All questions must be answered within one hour.3. The marks allotted to each question is clearly written at the top of each.4. You must answer/complete all questions in this paper.	

1. Object-Oriented Concepts (4 points (1 each))

Circle the best Answer for each of the following questions:

I. Information Hiding:

- a. A situation in which information is not displayed.
- b. Is to make one or more attribute(s) accessible by class functions only.
- c. The act of enabling operations to manipulate global data.
- d. Attributes must be visible to all classes in the programme.

II. Encapsulation

- a. Is to define for a class data and function members with a public part.
- b. Is to make members of a class accessible by all other classes in a problem.
- c. Is to define objects for all classes in the application.
- d. Is to make the function members inaccessible.

III. A Qualifier:

- a. Is the qualification of a class member to be a global member.
- b. Reduces the accessibility of associated objects from many to one.
- c. Allows the call of a function available in another object by qualification.
- d. Is the relationship between more than two classes.

IV. An Association Class is:

- a. A class that replaces other classes in an inheritance relationship.
- b. A whole and part relationship between three and more classes.
- c. A general relationship between two classes that collaborate to complete a functionality.
- d. A class representing a relationship between two or more classes.

2. Object-Oriented Concepts (9 points (3 each))

Briefly state the difference between each of the following with an example:

- a. Object and Class
- b. Association and Link
- c. Static and Dynamic Aggregation

3. Problem Analysis and Design (10 points)

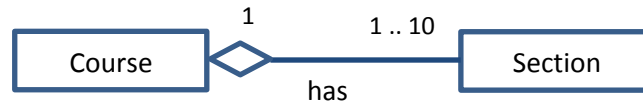
It is required to register the activities of children in a youth club such as, the details of the school they go to, the details of the sports they are interested in, their hobbies details, and the area they live in.

Such details are required to easily derive information about the children, such the children attending to the same school, playing the same sport, having the same hobbies, and living in the same area. Other information may also be derived.

Using UML Develop a class diagram to represent such information in a computer system. Your diagram must clearly indicate all possible classes and their relationships including relationship name and multiplicity. Briefly explain your choice of relationship and multiplicity.

4. Implementation (12 points (6+3+3))

In a university registration system a course has up-to 10 sections each of which is taught by an instructor and registered for by students as shown in the class diagram below.



- i. Using Java code the `Course` and `Section` classes for the above problem with their minimum number of necessary attributes and operations. Code operation signatures only.
- ii. If you have not done so in i. code the data structure to implement the relationship between the two (i.e. `Course` and `Section`) classes.
- iii. Code a suitable constructor function for each class.

